

CLAIMS

1. A shape memory alloy having a low martensitic transformation temperature, said alloy comprising Copper and Zinc in the range of 62-86% of Copper and 10-28% of Zinc along with 6% of Aluminum.
2. A shape memory alloy as claimed in claim 1, wherein said alloy having a martensitic transformation temperature lowered by about 80⁰C.
3. A shape memory alloy as claimed in claim 1, wherein said alloy displays good shape memory at a re-betatising temperature of about 575⁰C.
4. A shape memory alloy as claimed in claim 1, wherein said alloy having good fatigue properties thereby preventing quench cracking.
5. A shape memory alloy as claimed in claim 1, wherein said alloy once processed can be utilized for some other temperature device or application.
6. A shape memory alloy as claimed in claim 1, wherein said alloy having good shape memory response properties.
7. A process for lowering the Martensitic Transformation Temperature(As) of shape memory alloy as claimed in claim 1, by a re-betatising treatment of previously high temperature betatised material, said process comprising the following steps of:
 - (i) selecting an alloy comprising Copper and Zinc in the range of 62-86% of Copper and 10-28% of Zinc along with 6% of Aluminum;
 - (ii) melting alloy composition in an induction furnace operating in air under charcoal cover followed by casting into desired shapes;
 - (iii) homogenizing the above composition at 800⁰C for a period of about two hours followed by cooling;
 - (iv) surface machining for removing oxide scale formation;
 - (v) analyzing the alloy composition
 - (vi) re-heating the shaped material at about 575⁰C for about three minutes;
 - (vii) quenching said material with cold water;
 - (viii) obtaining a fully martensitic structure;
 - (ix) identifying the soft shape memory material with martensitic structure; and
 - (x) recording the temperature and structure of the material;

8. A process as claimed in claim 7, wherein the martensitic transformation temperature (A_s) is lowered by about 80°C .
9. A process as claimed in claim 7, wherein the loss of Zinc or Aluminum raises the martensitic transformation temperature whereas increase of these elements lowers the transformation temperature.
10. A process as claimed in claim 7, wherein material once cast and processed can be utilized for some other temperature device or application.
11. A process as claimed in claim 7, wherein shape memory response properties are not affected.
12. A process as claimed in claim 7, wherein the two-step betatizing and resultant lowering of transformation temperature is valid for higher Aluminum content of 6-10 % shape memory alloys.